

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Status of Claims:

No claims are currently being canceled.

Claims 1-17 are currently being amended.

No claims are currently being added.

This amendment and reply amends claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 1-17 are pending in this application.

Claim Objections:

In the Office Action, claim 2 was objected to, for the reasons set forth on page 2 of the Office Action. Due to the amendments made to claim 2, this objection has been overcome.

Claim Rejections – Prior Art:

In the Office Action, claims 1-4, 6-10, 13 and 14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Publication No. 2004/0070051 to Sugiyama et al. in view of U.S. Patent Publication No. 2002/0058385 to Noda; claim 5 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Sugiyama in view of Noda and further in view of U.S. Patent Publication No. 2004/0241958 to Guarini et al.; and claims 11 and 12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sugiyama in view of Noda and further in view of U.S. Patent Publication No. 2003/0102490 to Kubo. These rejections are traversed with respect to the presently pending claims under rejection, for at least the reasons given below.

In more detail, the Office Action correctly recognizes that Sugiyama fails to specifically teach an interface between a base layer and an active semiconductor layer is at a

depth of $2T_p$ or less from the surface, a built-up layer has a film thickness of $3T_p$ or greater (and/or $5T_p$), where T_p is the depth of maximum concentration of an impurity introduced from forming a source/drain region, in which the source/drain region is formed by an ion implantation method. However, the Office Action relies on Noda for teaching that different doses of ion implantations can be used, in a process of forming a source/drain region via an ion implantation method, and from this teaching of Noda, the Office Action asserts that “it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Noda in Sugiyama structure in order to have an interface between said base layer and said active semiconductor layer is at a depth of $2T_p$ or less from the surface, . . . , since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In addition, it is favorable to have an object to realize miniaturization by suppressing the dose loss phenomenon after impurity ion implantation (See Noda, paragraph 0011).”

In reply, the forming of an interface between a base layer and an active semiconductor layer to be at a depth of $2T_p$ or less from the surface, where T_p is the depth of maximum concentration of an impurity introduced for forming the source/drain region, is not obvious based on the combined teachings of Sugiyama and Noda, since the claimed features do not involve merely finding an optimum value of a result effective variable, but rather involve detailed knowledge of semiconductor layers and their properties by the inventors and tests performed by the inventors, as described in detail on pages 14 to 25 of the specification, whereby such knowledge is clearly outside the realm of the ordinary skilled artisan who has available to him/her the combined teachings of Sugiyama and Noda and common knowledge of the art at the time the invention was made.

The fact that Noda describes creating P-type high concentration diffusion layers in an N-type well beside a side wall in paragraph 0059 of that reference, says nothing about the formation of an interface having the specific features recited in the independent claims 1-3. Similarly, the disclosure in paragraphs 0066-0068, 0070 and 0092 of Noda concerning subjecting portions of a substrate to ion implantation, fall well short of the specific claim features of the formation of an interface between a base layer and an active semiconductor layer being at a depth of $2T_p$ or less (or $3T_p$ or less, as recited in independent claim 3) from

the surface, where T_p is the depth of maximum concentration of an impurity introduced for forming the source/drain region.

For example, based on the combined teachings of Sugiyama and Noda, the problems associated with “dislocation loops” would occur, as described on pages 22 to 24 of the specification, whereby the solution of this problem would not involve routine experimentation to find an optimum ion implantation scheme, as asserted in the Office Action, but rather would require knowledge of semiconductor materials gleaned by the inventors based on experiments that they have performed and hypotheses that they came up with, as described on pages 14 to 25 of the specification.

Applicant recognizes that MPEP § 2144.05. MPEP § 2144.05 II, entitled “Optimization of Ranges,” does indeed permit the rejection of claims as being obvious based on routine experimentation. However, Applicant points to MPEP § 2144.05 II(B), which states that

Only Result-effective Variables Can Be Optimized. A particular parameter must *first* be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonine* (citations omitted). (The claimed wastewater treatment device had a tank volume to contractor area of 0.12 gal./sq. ft. The prior art did not recognize that treatment capacity is a function of the tank volume to contractor ratio, and therefore the parameter optimized was not recognized in the art to be a result-effective variable.)

(Emphasis added, citations omitted.) As in *In re Antonine*, it is respectfully submitted that no evidence has been proffered that the prior art recognizes any connection between a film thickness of an interface based on a depth of maximum concentration of an impurity and a result. The Office Action points to nothing to indicate the existence of a recognized result-effective variable. The conclusions in the Office Action are so broadly stated, and without targeted application to the facts at hand, that they basically imply the establishment of a *prima facie* case of obviousness with respect to range recitations once any value outside a recited range is identified in the prior art – an implication that does not comport with the case law and the MPEP. No evidence has been proffered that the recited film thickness of an interface based on a depth of maximum concentration of an impurity has previously been recognized as

a result-effective variable. Based on case law and the MPEP, claim 1 is not obvious in view of optimization through routine experimentation.

Still further, regarding the particulars of the obviousness rejection, the Office Action fails to establish a *prima facie* case of obviousness. Applicant recognizes that *KSR* has liberalized the standards for finding a claim obvious. However, *KSR* is not a panacea which renders any claim unpatentable until proven otherwise. Specifically, the PTO has promulgated guidelines in MPEP §2143 regarding how a case for obvious may be established, citing various scenarios from prior Board of Appeals cases implementing *KSR*. The Office Action identifies not a single one of these guidelines. It is respectfully submitted that the alleged basis of obviousness proffered in the Office Action comports with none of those guidelines. While it is true that MPEP §2143 does recognize that there are other rationales which may be relied on, no such other rationale is articulated. Instead, a conclusory statement is proffered, both with respect to facts and finding, that is not substantiated in any way.

Accordingly, presently pending independent claims 1-3 are patentable over the cited art of record.

Conclusion:

Since all of the issues raised in the Office Action have been addressed in this Amendment and Reply, Applicant believes that the present application is now in condition for allowance, and an early indication of allowance is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith,

Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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